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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Paper No. 16

Application Number: 09/885,311

Filing Date: June 20, 2001

Appellant(s): LIVENGOOD ET AL.

John Brady
For Appellant

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EXAMINER'S ANSWER

This is in response to the appeal brief filed 23 June 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in

the brief. Appellant states there are no related appeals or interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct. Claims 9 and 20 have been withdrawn from the appeal. These claims will be treated in the manner specified in MPEP 1214.05 should the Examiner be reversed.

Upon further consideration the previously applied rejection over Lin under § 102 has been withdrawn.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct. The BPAI is advised that guidance to the meaning of the term "random copolymer" in the instant specification has been at issue during prosecution of the instant invention. Appellant changed the specification's description of this term and because of the change of this description during prosecution the Examiner lodged an objection to the specification under § 132. Appellant includes a discussion of this in the Brief pp. 3-4.

Appellant's brief presents arguments relating to the denial of entry of the amendment after final of 2 May 2003 and the objection under § 132. This issue relates to petitionable

subject matter under 37 CFR 1.181 and not to appealable subject matter. See MPEP § 1002 and § 1201.

(7) *Grouping of Claims*

The rejection of claims 1, 3-8, 10-19, 21, and 22 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7). Appellant affirms that the claims stand or fall together on Brief p. 5.

The Examiner respectfully suggests that claim 1 be chosen as representative of the claims under appeal.

(8) *ClaimsAppealed*

The copy of the appealed claims contained in the Appendix to the brief is correct. Withdrawn claims 9 and 20 and allowed claim 30 are included in the Appendix, but are not subject to the appeal.

(9) *Prior Art of Record*

US 4027048	Crystal	5-1977
US 5972553	Katada et al.	10-1999
US 5985501	Sato et al.	10-1999
US 5364724	Mahabadi et al.	11-1994

(10) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3-8, 10, 12, and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Crystal in US Patent 4,027,048. Claim 9 was rejected by this reference at Final but has been withdrawn from appeal by appellant. Identified as Issue 2 in the Brief.

Crystal discloses a toner containing two incompatible polymers. One polymer is a "tough" polymer that serves as a matrix. The other polymer is a "soft" polymer that is present as a plurality of discrete domains inside the matrix (col. 2, l. 15-42). This soft polymer provides desired fixing properties. The domain size of the matrix is preferably about 0.1 to about 2 microns (col. 4, l. 4-19). A compatibilizer (i.e., dispersing agent) is combined with the matrix polymer and domain polymer to improve dispersion of the domain in the matrix (col. 4, l. 34-63). One component of the compatibilizer is compatible with the matrix polymer and another component is compatible with the domain polymer, thus forming a copolymer (col. 4, l. 55-63) having one unit of the "tough" and one unit of the "soft" polymer. The reference specifically discloses a "shaded random" copolymer as effective as a compatibilizer. This shaded copolymer is defined as being a random copolymer (col. 4, l. 48-55) and is used in an amount of from about 1 to about 50 weight % (col. 5, l. 3-6). The amount of the compatibilizer affects the domain size (col. 4, l. 64-68). The Examples present compatibilizers with specific ratios of monomers pertinent to the instant claims.

Preferred matrix polymers include polystyrene, styrene copolymers, polymers of alkylmethacrylates, vinyl chloride polymers, polyamides, and polymers of acrylic or methacrylic acid (col. 3, l. 20-33), all of which fall within the scope of the primary resin of appealed claim 1. The glass transition temperature of the matrix polymer is greater than 50 °C, preferably about 55 °C to about 180 °C (col. 2, l. 43-55). The number-average molecular weight of the matrix polymer is preferably 5000 to about 300,000 (col. 2, l. 43-55). Preferred soft polymers include

polyolefin waxes (col. 3, l. 68), which would be understood by the artisan to release agents (see spec. p. 5, l. 1-12). The disclosure of the polyolefin wax is seen as being given with sufficient specificity as to be identically disclosed by the reference. The glass transition temperature of the domain polymer is less than about 30 °C, preferably about -50 °C to about 10 °C. The number-average molecular weight of the matrix polymer is preferably 500 to about 50,000 (col. 3, l. 34-44).

The toner can be combined with a carrier to form a developer (col. 6, l. 61-65).

Claims 1, 3-8, 10, 12-18, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crystal in US Patent 4,027,048 in view of Katada *et al.* in US Patent 5,972,553 and further in view of Sato *et al.* in US Patent 5,985,501. Identified as Issue 3 in the Brief.

Crystal was discussed above. In the event the disclosure is not specific enough to identically disclose the claimed toner composition in claims 1 3, 4-10, 12, and 22, this rejection is applied. Additionally, the reference does not identically disclose the claimed compatibilizer (dispersing agent) content or structural components of the compatibilizer (i.e., second resin), primary resin, and wax as specified in the additional dependent claims.

Katada discloses that waxes, such as polyolefins, are well known release agents. These components provide anti-offset character and low temperature fixing ability (col. 4, l. 35-38). Sato discloses release agents as low molecular weight polyolefins such as polyethylene and polypropylene (col. 7, l. 53-58).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use those use a polyolefin wax as the domain polymer in Crystal because this is a specifically disclosed domain polymer. It would also have been obvious to use

the shaded (random) copolymer as the dispersing agent (i.e., compatibilizer) in Crystal because this is one of three structures disclosed for the dispersing agent. It would have been obvious to optimize the amount of the dispersing agent to achieve nearly the same size of domains in the toners because Crystal teaches control of domain size via choice of dispersing agent amount. The artisan would expect similar size of domains in each toner particle because the amount of dispersion agent is constant throughout the composition.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use polyethylene or polypropylene as the polyolefin wax in Crystal because polyethylene and polypropylene are disclosed in Sato as known release agents and Katada discloses identifies polyolefins as effective waxes to provide low temperature fixing properties. The artisan would have been expected to use well known polyolefins for the low fixing temperature characteristics desired in Crystal for the soft polymer.

Given the disclosure of the specific matrix polymer constituents in Crystal (e.g., methacrylate, methacrylic acid) and the disclosure of useful polyolefin waxes in the supporting references, such as polyethylene, the artisan would have been motivated to produce the dispersing agent from monomer units corresponding to each of the matrix polymer and polyolefin waxes.

Claim 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crystal in US Patent 4,027,048 in view of Katada *et al.* in US Patent 5,972,553 and further in view of Sato *et al.* in US Patent 5,985,501 as applied to claims 1, 3-9, 10, 12-18, 21, and 22 above, and further in view of Mahabadi *et al.* in US Patent 5,364,724. Identified as Issue 4 in the Brief.

Crystal, Katada, and Sato were described above. The references do not disclose olefin as a monomer for the matrix polymer, but Mahabadi discloses that typical vinyl monomers for a

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toner resin include unsaturated mono-olefins (col. 5, l. 49-51). The disclosure of polymers for the toner resin in Mahabadi overlaps substantially with the polymers disclosed in Crystal (see Mahabadi: col. 5, l. 36-68). These binder resins are used in toners where compatibility with a wax (e.g., polyethylene and polypropylene) is desired (col. 5, l. 6-10).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an unsaturated mono-olefin as one of the monomers for the matrix polymer in Crystal because Mahabadi discloses olefins as particularly effective and both references are concerned with using compatibilizers for waxes and binder resins. There is sufficient similarity between the disclosures of the references to indicate that the artisan would have a likelihood of success in making the proposed combination.

(11) Response to Argument

In the Argument appellants provide a discussion of the term "random copolymer" (pp. 5-6). Appellant states that the rejection uses the specification to include both alternating and block copolymers and that if the specification supports this position these statements are disavowed. General statements in this regard have been canceled or "corrected". Appellant then discusses the narrowing of the disclosure in this regard and that no new matter was introduced in the amendment of 24 February 2003

Appellant also states that examination of the claims corresponding to the clearly stated, intended meaning of the claims should be made. Appellant also states that he is unaware of any doctrine in patent law that permits the examiner to demand that the claims mean something different than their clear wording when those claims are supported by an accurate and specific disclosure. All rejections are seen as faulty because they are based on an erroneous interpretation of the claims.

The Examiner will respond in detail to these points within the discussion of the rejections. However, it is important to point out that the Examiner has never stated that the claims (or the reference) should be interpreted in a manner other than their clear meaning, particularly when supported by the disclosure. As will be discussed below, the Examiner has given the claims their broadest reasonable interpretation, as required by law and Office policy. Further, the Examiner's interpretation of the claims is consistent with specification disclosure as filed and the reference's disclosure.

With respect to the § 102 rejection over Crystal alone, appellant states that the dispersing agent of Crystal is not a random copolymer because of its shaded nature. That is, there is a higher concentration of one unit at one end of the copolymer and a higher content of the other unit at the other end. Such a copolymer is not a random copolymer according to appellant, even though the reference discloses the copolymer using the same word (i.e., random). Appellant's interpretation of the reference requires that it mean something different than its clear wording. This approach is improper when considering the reference as well as when construing the appealed claims. Crystal specifically states that its dispersing agent is a "random copolymer" (col. 4, l. 49). Construing the term based on its clear meaning, it must be seen as meaning that the copolymer is random.

Crystal's use of the term "random copolymer" is not inconsistent with the specification as filed. The instant specification as-filed discusses random copolymers as follows.

"[B]lock copolymers are one end of a spectrum of copolymers that ranges from alternating to block copolymers. This is to say that for a copolymer made from A and B monomers, one end of the spectrum is a polymer comprised of strictly alternating A-B-A-B units (an "alternating copolymer"), while the other end is a

polymer having one end A-A-A in a single block with the other end B-B-B in a single block (a 'block copolymer'). Random copolymers lie within these two extremes." (original spec. p. 12).

Specification page 14 as filed also states that random copolymers are composed of "domains" of their monomer components interspersed in the polymer chain. They range from the extreme of pure alternating copolymers to pure block copolymer. The specification as filed clearly identifies a block copolymer as different from a random copolymer. The specification also shows that the random copolymer lies between the extremes of a block copolymer and an alternating copolymer. Note that "domains" of each unit are permitted within the scope of a random copolymer.

The Crystal reference, likewise, defines a block copolymer as different from a shaded random copolymer. In column 4, lines 33+ Crystal states that dispersing agent may take the form of a block copolymer, a graft copolymer, or a shaded random copolymer. Note that the block copolymer and shaded random copolymer are alternatives. Clearly the shaded random copolymer is different from a block copolymer in Crystal and falls within one of the extremes defined in the specification as filed. The higher concentration of a monomer unit at each end of the copolymer is not a block because the ends are not entirely composed of one unit.

The shaded random copolymer also appears to be within the other extreme discussed in the as-filed specification because it is not a perfectly alternating copolymer (i.e., units of A-B-A-B) noting the monomer unit concentrations disclosed.

Considering the reference in terms of the specification disclosure it is reasonable to consider the reference's shaded copolymer to be a random copolymer because it is between the extremes of a block copolymer and an alternating copolymer in the continuum of copolymer construction. The specification states that the claimed random copolymer is within these

endpoints and Crystal's random copolymer is likewise within these endpoints. Further, Crystal states that its copolymer is random. This is the same word used in the claims. The language of the reference cannot be discounted as attempted in the Brief. Crystal shows that one of ordinary skill considers a shaded polymer as a random copolymer, not a block copolymer and not a graft copolymer. The instant claims, in light of the specification, also do not prescribe any specific degree of randomness or copolymer unit arrangement. The degree of randomness in Crystal is seen as included within the scope of the claims and within the meaning of random in the art because Crystal specifically states that the shaded copolymer is a type of random copolymer.

Crystal's shaded copolymer is a random copolymer -- the reference states this. The instant claims do not define the term "random" in a manner which defines over the random structure of Crystal, nor is their a required definition of the term "random copolymer" in the specification as filed that is imposed on the claims.

As this is the only reason for traversal in the instant Brief, the Answer is seen as fully responsive to the issues raised in the Brief for this rejection.

With respect to the § 103 rejection of Crystal in US Patent 4,027,048 in view of Katada *et al.* in US Patent 5,972,553 and further in view of Sato *et al.* in US Patent 5,985,501, appellant is understood to only traverse this rejection because Crystal does not disclose a "truly random copolymer". The claims do not state "truly" random nor do they define the meaning of such a term. The claims state a "random copolymer" and must be interpreted giving the terms their clear meaning. Crystal clearly teaches that the artisan would desired a random copolymer because random copolymer dispersing agents are specifically disclosed. Appellant has not challenged the Examiner finding that it would have been obvious to those use a polyolefin wax

as the domain polymer in Crystal or to use polyethylene or polypropylene as the polyolefin wax in Crystal. lacking any further grounds of traversal and given the clear teaching of random copolymers in Crystal (the remarks in the § 102 rejection are incorporated here) the artisan would have found the claimed invention obvious.

With respect to the § 103 rejection of Crystal in view of Katada *et al.* and further in view of Sato *et al.*, still further in view of Mahabadi *et al.*, appellant states that the supporting Mahabadi reference does not overcome the deficiencies of Crystal. Because the traversal of this rejection is dependent solely on the disclosure of random copolymers in Crystal and because Crystal teaches this feature for the reasons given above, the traversal is seen as fully responded to and the rejection proper. The remarks in the § 102 rejection are incorporated here.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

CHRISTOPHER RODEE
PRIMARY EXAMINER

cdr
July 14, 2003

Conferees

Mark Huff



Patrick Ryan



LEXMARK INTERNATIONAL, INC.
INTELLECTUAL PROPERTY LAW DEPARTMENT
740 WEST NEW CIRCLE ROAD
BLDG. 082-1
LEXINGTON, KY 40550-0999